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Title: COASTAL HIGH-RESOLUTION OBSERVATIONS AND REMOTE SENSING OF ECOSYSTEMS (C-HORSE)

Text: Coastal benthic marine ecosystems, such as coral reefs, seagrass beds, and kelp forests are highly productive as well as ecologically and commercially important resources. These systems are vulnerable to degraded water quality due to coastal development, terrestrial run-off, and harmful algal blooms. Measurements of these features are important for understanding linkages with land-based sources of pollution and impacts to coastal ecosystems. Challenges for accurate remote sensing of coastal benthic (shallow water) ecosystems and water quality are complicated by atmospheric scattering/absorption (~80+% of the signal), sun glint from the sea surface, and water column scattering (e.g., turbidity). Further, sensor challenges related to signal to noise (SNR) over optically dark targets as well as insufficient radiometric calibration thwart the value of coastal remotely-sensed data. Atmospheric correction of satellite and airborne remotely-sensed radiance data is crucial for deriving accurate water-leaving radiance in coastal waters. C-HORSE seeks to optimize coastal remote sensing measurements by using a novel airborne instrument suite that will bridge calibration, validation, and research capabilities of bio-optical measurements from the sea to the high altitude remote sensing platform. The primary goal of C-HORSE is to facilitate enhanced optical observations of coastal ecosystems using state of the art portable microradiometers with 19 targeted spectral channels and flight planning to optimize measurements further supporting current and future remote sensing missions.